ABSTRACT FINAL ID: SH43D-02;

TITLE: Magnetofluid Simulations of the Global Solar Wind Including Pickup Ions and Turbulence Modeling *(Invited)*

SESSION TYPE: Oral

SESSION TITLE: SH43D. Data-Driven Simulation of the Heliosphere I

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Title of Team:

ABSTRACT BODY: I will describe a three-dimensional magnetohydrodynamic model of the solar wind that takes into account turbulent heating of the wind by velocity and magnetic fluctuations as well as a variety of effects produced by interstellar pickup protons. In this report, the interstellar pickup protons are treated as one fluid and the protons and electrons are treated together as a second fluid. The model equations include a Reynolds decomposition of the plasma velocity and magnetic field into mean and fluctuating quantities, as well as energy transfer from interstellar pickup protons to solar wind protons that results in the deceleration of the solar wind. The model is used to simulate the global steady-state structure of the solar wind in the region from 0.3 to 100 AU. Where possible, the model is compared with Voyager data. Initial results from generalization to a three-fluid model is described elsewhere in this session.

KEYWORDS: [7863] SPACE PLASMA PHYSICS / Turbulence, [7524] SOLAR PHYSICS, ASTROPHYSICS, AND ASTRONOMY / Magnetic fields, [7839] SPACE PLASMA PHYSICS / Nonlinear phenomena, [7833] SPACE PLASMA PHYSICS / Mathematical and numerical techniques.

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Previously Presented Material: 20% ApJ

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